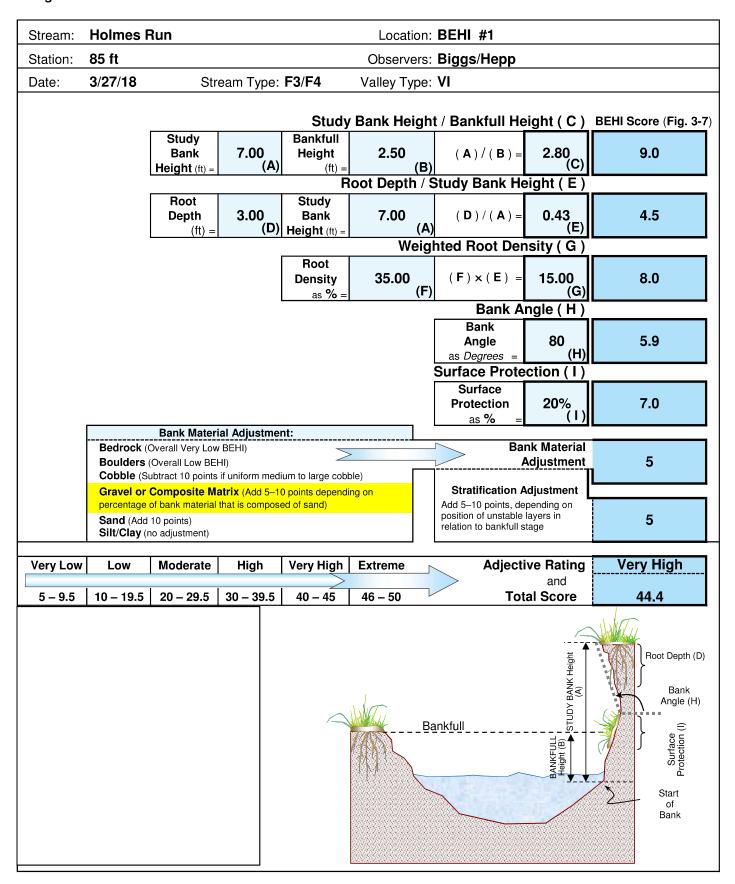
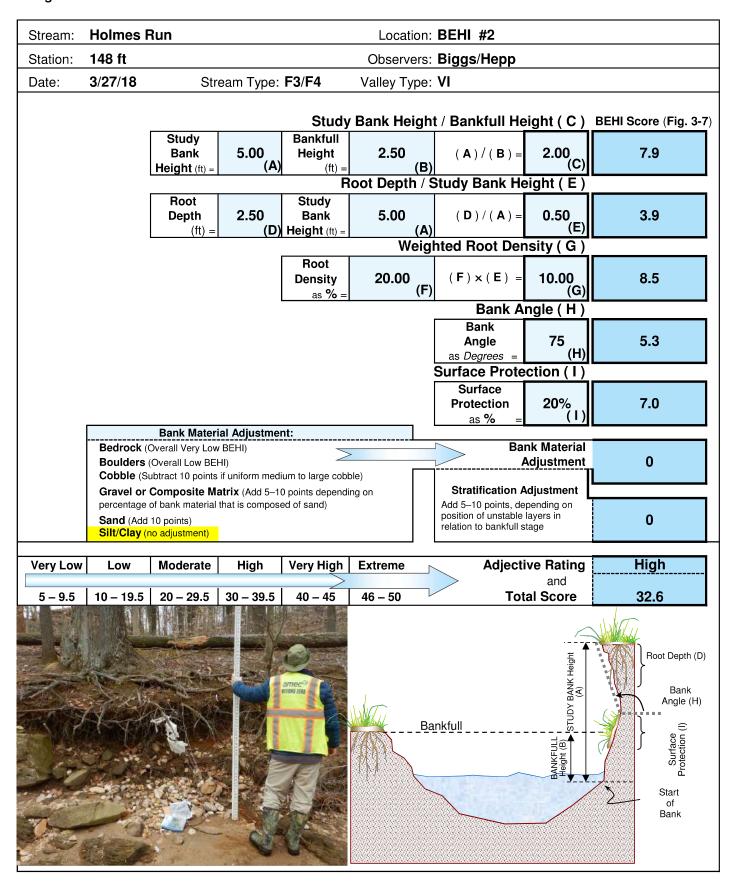
**Worksheet 3-11.** Form to calculate Bank Erosion Hazard Index (BEHI) variables and an overall BEHI rating. Use **Figure 3-7** with BEHI variables to determine BEHI score.



**Worksheet 3-12.** Various field methods of estimating Near-Bank Stress (NBS) risk ratings to calculate erosion rate.

erosion	rate.								
			Estim	ating Nea	r-Bank St	ress ( NB	S)		
Stream:	Holme	s Run			Location:	BEHI #1			
Station:	85 ft			S	tream Type:	F3/F4	1	/alley Type:	VI
Observe	rs:	Biggs/Hep	pp					Date:	3/27/18
			Methods fo	or Estimati	ng Near-Ba	ank Stress	(NBS)		
( <b>1</b> ) Chanr	nel pattern	, transverse ba	r or split channe	el/central bar cr	eating NBS	Recona	issance		
(2) Ratio	of radius o	of curvature to b	ankfull width (	R <sub>c</sub> / W <sub>bkf</sub> )		prediction			
(3) Ratio	of pool slo	pe to average	water surface s	ope (S <sub>p</sub> /S)			Level II	General	prediction
(4) Ratio	of pool slo	pe to riffle slop	e(S <sub>p</sub> /S <sub>rif)</sub>				Level II	General	prediction
( <b>5</b> ) Ratio	of near-ba	nk maximum d	epth to bankfull	mean depth (	d <sub>nb</sub> / d <sub>bkf</sub> )		Level III	Detailed	prediction
( <b>6</b> ) Ratio	of near-ba	nk shear stress	to bankfull she	ear stress ( $ au_{ ext{nb}}$ /	τ <sub>bkf</sub> )		Level III	Detailed	prediction
( <b>7</b> ) Veloc	ity profiles	/ Isovels / Velo					Level IV		
/el I	(1)								
Level	(-/	1			ration, conver				
		Radius of	Bankfull		Near-Bank				
	(2)	Curvature	Width W <sub>bkf</sub>	Ratio R <sub>c</sub> /	Stress				
	( )	R <sub>c</sub> (ft)	(ft)	$W_{bkf}$	(NBS)	Ì			aissance prediction prediction prediction prediction prediction prediction dation ph / Very High BS = Extreme
					N D				
=		Pool Slope	Average		Near-Bank Stress		Dom	inant	1
Level II	(3)	S <sub>p</sub>	Slope S	Ratio S <sub>p</sub> / S	(NBS)	_		nk Stress	
							Hi	gh	
	(4)				Near-Bank	'			-
		Pool Slope	Riffle Slope	Ratio S <sub>p</sub> / S <sub>rif</sub>	Stress				
	, ,	S <sub>p</sub>	S <sub>rif</sub>	S <sub>rif</sub>	(NBS)				
		Near-Bank			Nasa Danie				
	<b>/=</b> \	Max Depth	Mean Depth	<i>Ratio</i> d <sub>nb</sub> /	Near-Bank Stress				
	(5)	d <sub>nb</sub> (ft)	d <sub>bkf</sub> (ft)	d <sub>bkf</sub>	(NBS)	1			
=									
Level III	(0)			Near-Bank Shear			Bankfull Shear		
Ļ		Near-Bank Max Depth	Near-Bank		Mean Depth	A.,	Stress τ <sub>bkf</sub> (	Batio τ <sub>sb</sub> /	
	(6)	d <sub>nb</sub> (ft)	Slope S <sub>nb</sub>	lb/ft <sup>2</sup> )	d <sub>bkf</sub> (ft)	Slope S	Ib/ft <sup>2</sup> )	$ au_{\mathrm{bkf}}$	
				,		l l	,	2111	
>				Near-Bank					
Level IV	(7)		dient (ft/sec	Stress					
FeV	(1)	/ f	t)	(NBS)	 				
		Cor	nverting Va	lues to a l	Near-Bank	Stress (NE	S) Rating		
Near-E		ess (NBS)	(4)	(2)		ethod numb		(2)	<b>—</b>
ratings			(1)	(2)	(3)	(4)	(5)	(6)	
	Very Low		N/A N/A	> 3.00	< 0.20	< 0.40	< 1.00	< 0.80	
			N/A	2.21 – 3.00 2.01 – 2.20	0.20 - 0.40 0.41 - 0.60	0.41 - 0.60 $0.61 - 0.80$	1.00 – 1.50 1.51 – 1.80	0.80 - 1.05 1.06 - 1.14	
	High		See	1.81 – 2.00	0.41 - 0.80	0.81 – 0.80	1.81 – 1.80	1.15 – 1.19	
	Very Hi		(1)	1.50 – 1.80	0.81 - 0.80	1.01 – 1.20	2.51 – 3.00	1.20 – 1.60	
	Extren	-	Above	< 1.50	> 1.00	> 1.20	> 3.00	> 1.60	
					lear-Bank S				gh
				Overall IV	cai-Dalik 3	AUCOO (IND	o, rainiy	П	gii

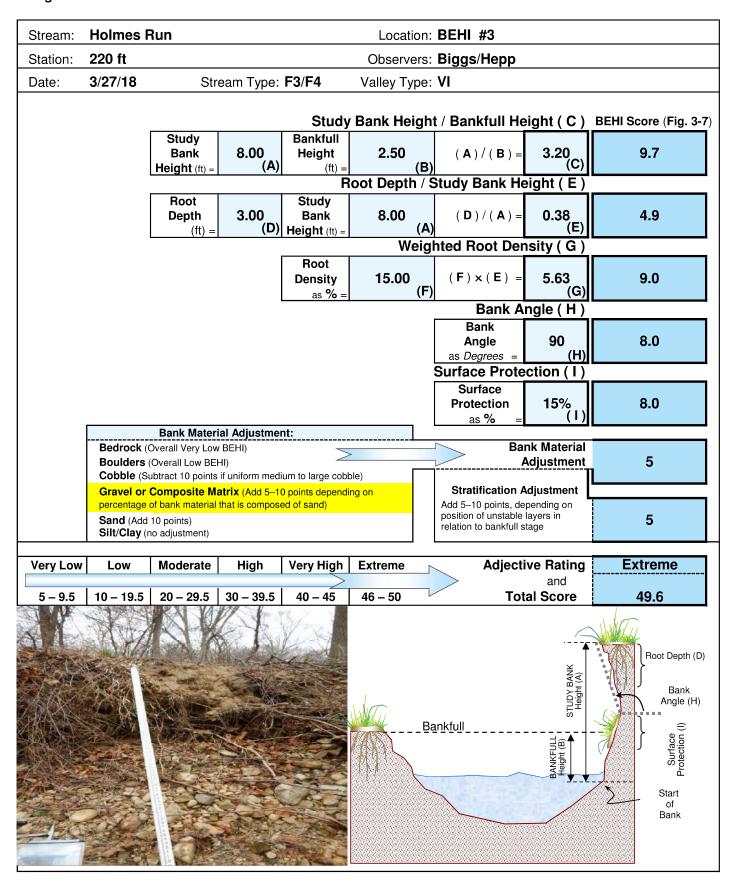
**Worksheet 3-11.** Form to calculate Bank Erosion Hazard Index (BEHI) variables and an overall BEHI rating. Use **Figure 3-7** with BEHI variables to determine BEHI score.



**Worksheet 3-12.** Various field methods of estimating Near-Bank Stress (NBS) risk ratings to calculate erosion rate.

erosion	raie.										
Estimating Near-Bank Stress (NBS)											
Stream: Holmes Run Location: BEHI #2											
Station:	148 ft			S	tream Type:	F3/F4	,	Valley Type:	VI		
Observe	rs:	Biggs/Hep	р				Date: <b>3/27/18</b>				
			Methods fo	or Estimati	ng Near-B	ank Stress	(NBS)				
(1) Chanr	nel pattern	, transverse bai	or split channe	el/central bar cr	eating NBS		Level I	Recona	aissance		
( <b>2</b> ) Ratio	of radius o	f curvature to b	ankfull width ( I	R <sub>c</sub> / W <sub>bkf</sub> )			Level II	General	prediction		
( <b>3</b> ) Ratio	of pool slo	pe to average v	vater surface sl	ope (S <sub>p</sub> /S)			Level II				
( <b>4</b> ) Ratio	of pool slo	pe to riffle slope	e ( S <sub>n</sub> / S <sub>rif</sub> )	<u> </u>			Level II	General	prediction		
		nk maximum de	•	mean depth (	d <sub>nh</sub> / d <sub>hkf</sub> )		Level III	Detailed	prediction		
		nk shear stress					Level III	Detailed	prediction		
		/ Isovels / Velo		( III	UNI 7		Level IV				
_		Transverse a	nd/or central b	ars-short and	or discontinuo	ous					
Level	(1)		•		,						
ت				meander mig	ration, conve	rging flow		NI	BS = Extreme		
		Radius of	Bankfull	Potio P /	Near-Bank						
	(2)	Curvature R <sub>c</sub> (ft)	Width W <sub>bkf</sub> (ft)	<i>Ratio</i> R <sub>c</sub> / W <sub>bkf</sub> .	Stress (NBS)						
		1 10 (11)	(11)	- F DKI	(NEC)				pate: 3/27/18  conaissance leral prediction leral prediction alled prediction alled prediction alled prediction  Walidation  = High / Very HighNBS = ExtremeNBS = ExtremeNBS = Extreme (NBS)  (7) 0 < 0.50 1.05		
ŀ					Near-Bank	l					
=	(3)	Pool Slope	Average		Stress		Dom	inant	1		
Level II	(3)	S <sub>p</sub>	Slope S	Ratio S <sub>p</sub> / S	(NBS)		Near-Bai	Reconaissance General prediction General prediction Detailed prediction Detailed prediction Validation  NBS = High / Very Highter NBS = Extrem			
_							Hi	gh			
					Near-Bank				_		
	(4)	Pool Slope	Riffle Slope	Ratio S <sub>p</sub> /	Stress						
	( - /	S <sub>p</sub>	S <sub>rif</sub>	S <sub>rif</sub>	(NBS)	1					
		Nasa Dank				l					
		Near-Bank Max Depth	Mean Depth	<i>Ratio</i> d <sub>nb</sub> /	Near-Bank Stress						
	(5)	d <sub>nb</sub> (ft)	d <sub>bkf</sub> (ft)	d <sub>bkf</sub>	(NBS)						
=											
Level III				Near-Bank			Bankfull				
Le		Near-Bank	Near-Bank	Shear			Shear	Datia a /	Near-Bank		
	(6)	Max Depth	Slope S <sub>nb</sub>	Stress $\tau_{nb}$ (	Mean Depth		Stress $\tau_{bkf}$ (				
		d <sub>nb</sub> (ft)	Olope Onb	10/11 )	d <sub>bkf</sub> (ft)	Slope S	lb/ft <sup>2</sup> )	bkf	(NBS)		
				Maria D. J.							
Level IV	,·	Velocity Grad	lient ( ft / sec	Near-Bank Stress							
eve	(7)	/ f		(NBS)	,						
ĭ											
		Cor	verting Va	dues to a t	Near-Bank	Stress (NE	RS) Rating				
Near-B	ank Str	ess (NBS)	iverting ve			ethod numk					
ratings			(1)	(2)	(3)	(4)	(5)	(6)	(7)		
Very Low			N / A	> 3.00	< 0.20	< 0.40	< 1.00	< 0.80	< 0.50		
	Low		N / A	2.21 – 3.00	0.20 - 0.40	0.41 - 0.60	1.00 – 1.50	0.80 - 1.05	0.50 - 1.00		
	Modera	ate	N / A	2.01 – 2.20	0.41 – 0.60	0.61 – 0.80	1.51 – 1.80	1.06 – 1.14	1.01 – 1.60		
High			See	1.81 – 2.00	0.61 – 0.80	0.81 – 1.00	1.81 – 2.50	1.15 – 1.19	1.61 – 2.00		
	Very Hi	gh	(1)	1.50 – 1.80	0.81 – 1.00	1.01 – 1.20	2.51 – 3.00	1.20 – 1.60	2.01 – 2.40		
	Extren	пе	Above	< 1.50	> 1.00	> 1.20	> 3.00	> 1.60	> 2.40		
				Overall N	ear-Bank S	Stress (NB	S) rating	Hi	gh		

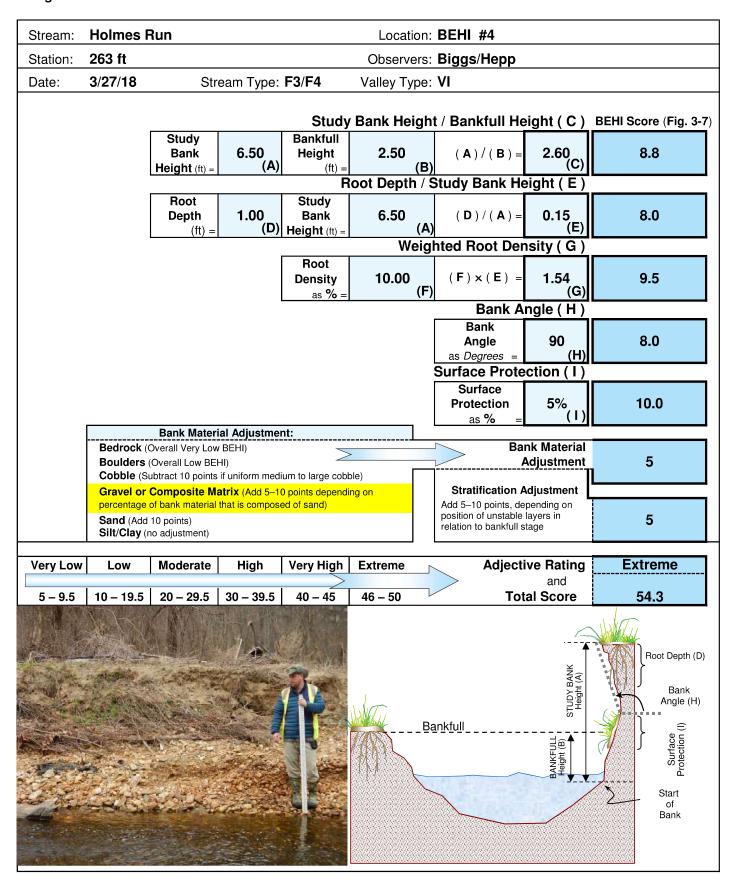
**Worksheet 3-11.** Form to calculate Bank Erosion Hazard Index (BEHI) variables and an overall BEHI rating. Use **Figure 3-7** with BEHI variables to determine BEHI score.



**Worksheet 3-12.** Various field methods of estimating Near-Bank Stress (NBS) risk ratings to calculate erosion rate.

erosion rate.										
Estimating Near-Bank Stress (NBS)										
Stream:	Holme	s Run			Location:	BEHI #3				
Station: 220 ft				S	tream Type:	ype: <b>F3/F4</b> Valley Type: <b>VI</b>				
Observers: Biggs/He			р					Date:	3/27/18	
			Methods fo	or Estimati	ng Near-B	ank Stress	(NBS)			
( <b>1</b> ) Chanr	nel pattern	, transverse ba	r or split channe	el/central bar cr	eating NBS		Level I	Reconaissance		
(2) Ratio	of radius o	of curvature to b	ankfull width ( I	R <sub>c</sub> / W <sub>bkf</sub> )			Level II	General	prediction	
( <b>3</b> ) Ratio	of pool slo	pe to average v	water surface sl	ope (S <sub>p</sub> /S)			Level II	General	prediction	
(4) Ratio	of pool slo	pe to riffle slop	e (S <sub>p</sub> /S <sub>rif</sub> )				Level II	General	prediction	
( <b>5</b> ) Ratio	of near-ba	nk maximum d	epth to bankfull	mean depth (	d <sub>nb</sub> / d <sub>bkf</sub> )		Level III	Detailed	prediction	
(6) Ratio	of near-ba	nk shear stress	to bankfull she	ear stress ( τ <sub>nb</sub> /	τ <sub>bkf</sub> )		Level III	Detailed	prediction	
( <b>7</b> ) Veloc	ity profiles	/ Isovels / Velo	city gradient				Level IV	Valid	lation	
								_		
Level	(1)									
		l		meander mig		ging now		INE	oo = Extreme	
		Radius of Curvature	Bankfull Width W <sub>bkf</sub>	Ratio R <sub>c</sub> /	Near-Bank Stress					
	(2)	R <sub>c</sub> (ft)	(ft)	W <sub>bkf</sub>	(NBS)	-				
_					Near-Bank	•			•	
Level II	(3)	Pool Slope	Average	D :: 0 /0	Stress					
Le	(-)	S <sub>p</sub>	Slope S	Ratio S <sub>p</sub> / S	(NBS)			inant nk Stress gh		
							П	gn		
	(4)	Pool Slope	Riffle Slope	Ratio S <sub>p</sub> /	Near-Bank Stress					
		S <sub>p</sub>	S <sub>rif</sub>	S <sub>rif</sub>	(NBS)					
		Near-Bank			Near-Bank					
	(5)	Max Depth	Mean Depth	<i>Ratio</i> d <sub>nb</sub> /	Stress					
_	(0)	d <sub>nb</sub> (ft)	d <sub>bkf</sub> (ft)	d <sub>bkf</sub>	(NBS)	1				
Level III				Near-Bank			Bankfull			
-ev	(6)	Near-Bank		Shear			Shear		Noor Pools	
		Max Depth	Near-Bank	_	Mean Depth	Average	Stress $\tau_{\text{bkf}}$ (	Ratio $\tau_{\text{nb}}$ /	Near-Bank Stress	
	(-)	d <sub>nb</sub> (ft)	Slope S <sub>nb</sub>	lb/ft <sup>2</sup> )	d <sub>bkf</sub> (ft)	Slope S	lb/ft <sup>2</sup> )	$ au_{bkf}$	(NBS)	
≥				Near-Bank		<u> </u>				
Level IV	(7)	l	dient (ft / sec	Stress						
Le	` '	/ f	ι <i>)</i>	(NBS)	1					
			nverting Va	lues to a l	Near-Bank	•				
Near-B		ess (NBS)	/4\	(2)		ethod numb		<b>/6</b> )	/7\	
ratings Very Low			<b>(1)</b> N / A	(2)	(3)	<b>(4)</b> < 0.40	(5)	(6)	(7)	
	Low		N/A	> 3.00 2.21 – 3.00	< 0.20 0.20 - 0.40	< 0.40 0.41 – 0.60	< 1.00 1.00 – 1.50	< 0.80 0.80 - 1.05	< 0.50 0.50 – 1.00	
	Modera		N/A	2.21 – 3.00	0.20 - 0.40	0.41 - 0.80	1.51 – 1.80	1.06 – 1.14	1.01 – 1.60	
High			See	1.81 – 2.00	0.41 - 0.80	0.81 – 0.80	1.81 – 2.50	1.15 – 1.19	1.61 – 2.00	
	Very H		(1)	1.50 – 1.80	0.81 – 1.00	1.01 – 1.20	2.51 – 3.00	1.20 – 1.60	2.01 – 2.40	
	Extren	-	Above	< 1.50	> 1.00	> 1.20	> 3.00	> 1.60	> 2.40	
					ear-Bank S				gh	
				O V CI all IV	Jai Daiik (	2.1033 (14D	o, rating		9''	

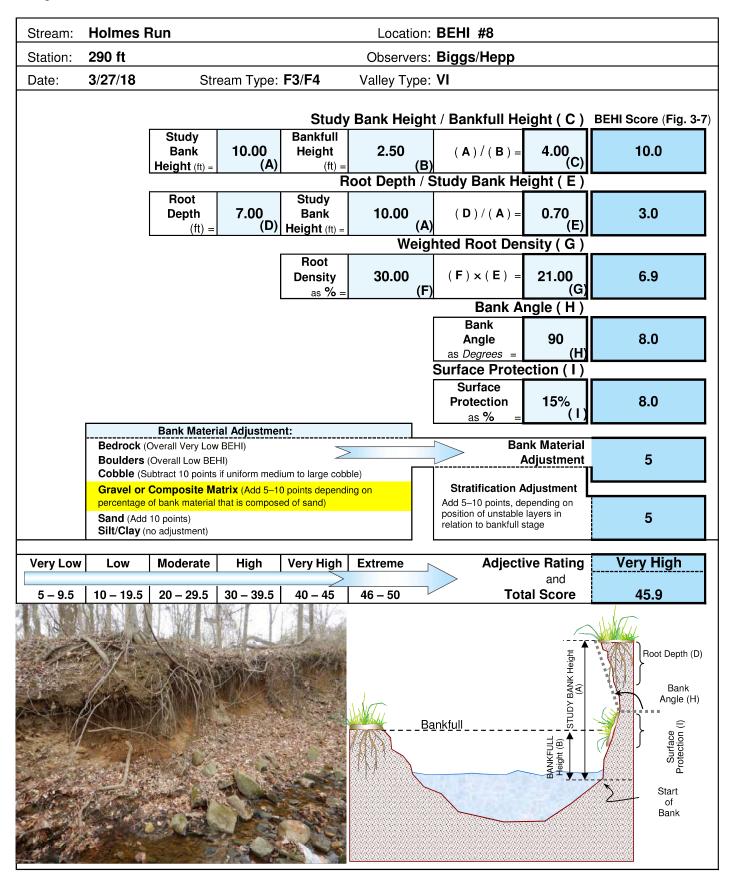
**Worksheet 3-11.** Form to calculate Bank Erosion Hazard Index (BEHI) variables and an overall BEHI rating. Use **Figure 3-7** with BEHI variables to determine BEHI score.



**Worksheet 3-12.** Various field methods of estimating Near-Bank Stress (NBS) risk ratings to calculate erosion rate.

erosion rate.										
Estimating Near-Bank Stress (NBS)										
Stream:	Holme	s Run			Location:	BEHI #4				
Station: 263 ft				S	tream Type:	F3/F4	<b>-3/F4</b> Valley Type: <b>VI</b>			
Observers: Biggs/He			р					Date:	3/27/18	
			Methods fo	or Estimati	ng Near-B	ank Stress	(NBS)			
( <b>1</b> ) Chanr	nel pattern	, transverse ba	r or split channe	el/central bar cr	eating NBS		Level I	Recona	issance	
(2) Ratio	of radius of	of curvature to b	ankfull width ( I	R <sub>c</sub> / W <sub>bkf</sub> )			Level II	General	prediction	
( <b>3</b> ) Ratio	of pool slo	pe to average v	vater surface sl	lope (S <sub>p</sub> /S)			Level II	General	prediction	
(4) Ratio	of pool slo	pe to riffle slop	e ( S <sub>p</sub> / S <sub>rif</sub> )				Level II	General	prediction	
( <b>5</b> ) Ratio	of near-ba	ınk maximum d	epth to bankfull	mean depth (	d <sub>nb</sub> / d <sub>bkf</sub> )		Level III	Detailed	prediction	
(6) Ratio	of near-ba	ınk shear stress	to bankfull she	ear stress ( $ au_{nb}$ /	τ <sub>bkf</sub> )		Level III	Detailed	prediction	
( <b>7</b> ) Veloc	ity profiles	/ Isovels / Velo	city gradient				Level IV	Valic	lation	
Level	(1)									
				meander mig		ging now		INE	oo = Extreme	
		Radius of Curvature	Bankfull Width W <sub>bkf</sub>	Ratio R <sub>c</sub> /	Near-Bank Stress					
	(2)	R <sub>c</sub> (ft)	(ft)	$W_bkf$	(NBS)	,				
									Date: 3/27/18  Reconaissance eneral prediction eneral prediction etailed prediction Validation S = High / Very HighNBS = Extreme NBS = Extreme NBS = Extreme (NBS)  (NBS)  6) (7) 0.80 < 0.50 - 1.05	
_					Near-Bank	·				
Level II	(3)	Pool Slope	Average	D-#- 0 /0	Stress			inant		
Le	(-)	S <sub>p</sub>	Slope S	Ratio S <sub>p</sub> / S	(NBS)	1		nk Stress		
							very	High		
	(4)	Pool Slope	Riffle Slope	Ratio S <sub>p</sub> /	Near-Bank Stress					
		S <sub>p</sub>	S <sub>rif</sub>	S <sub>rif</sub>	(NBS)					
		·								
		Near-Bank			Near-Bank					
	(5)	Max Depth	Mean Depth	Ratio d <sub>nb</sub> /	Stress					
_	(0)	d <sub>nb</sub> (ft)	d <sub>bkf</sub> (ft)	d <sub>bkf</sub>	(NBS)	1				
Level III		I		Near-Bank			Bankfull			
ev.		Near-Bank		Shear			Shear		Near Book	
_	(6)	Max Depth	Near-Bank	Stress $\tau_{nb}$ (	Mean Depth	Average	Stress $ au_{bkf}$ (	Ratio $ au_{\sf nb}$ /	_	
	(-)	d <sub>nb</sub> (ft)	Slope S <sub>nb</sub>	lb/ft <sup>2</sup> )	d <sub>bkf</sub> (ft)	Slope S	lb/ft <sup>2</sup> )	$ au_{bkf}$		
≥				Near-Bank						
Level IV	(7)	Velocity Grad		Stress						
Le	` ′	/ f	ι)	(NBS)	1					
			verting Va	alues to a l	Near-Bank					
Near-B		ess (NBS)	/4\	(0)		ethod numb		/ <b>6</b> \	(7)	
ratings Very Low			<b>(1)</b> N / A	<b>(2)</b> > 3.00	<b>(3)</b> < 0.20	<b>(4)</b> < 0.40	<b>(5)</b> < 1.00		` ` '	
	Low		N/A	> 3.00 2.21 – 3.00	< 0.20 0.20 - 0.40	< 0.40 0.41 – 0.60	< 1.00 1.00 – 1.50	< 0.80 0.80 – 1.05		
Moderate			N/A	2.21 – 3.00	0.20 - 0.40	0.41 - 0.80	1.51 – 1.80	1.06 – 1.14		
High			See	1.81 – 2.00	0.41 - 0.80	0.81 - 0.80	1.81 – 2.50	1.15 – 1.19		
	Very H		(1)	1.50 – 1.80	0.81 – 1.00	1.01 – 1.20	2.51 – 3.00	1.20 – 1.60	2.01 – 2.40	
	Extren		Above	< 1.50	> 1.00	> 1.20	> 3.00	> 1.60	> 2.40	
<u> </u>					ear-Bank S				High	
				O VOI all IV	Jai Daiik (	2.1033 (IAD	c, rating	Very	. ngn	

**Worksheet 3-11.** Form to calculate Bank Erosion Hazard Index (BEHI) variables and an overall BEHI rating. Use **Figure 3-7** with BEHI variables to determine BEHI score.



**Worksheet 3-12.** Various field methods of estimating Near-Bank Stress (NBS) risk ratings to calculate erosion rate.

erosion rate.										
Estimating Near-Bank Stress ( NBS )										
Stream:	Holme	s Run			Location:	BEHI #8				
Station:	290 ft			S	tream Type:	F3/F4	Valley Type: <b>VI</b>			
Observe	ers:	Biggs/Hep	р					Date:	3/27/18	
			Methods fo	or Estimati	ng Near-B	ank Stress	(NBS)			
( <b>1</b> ) Chanr	nel pattern	, transverse ba	r or split channe	or split channel/central bar creating NBS				Recona	issance	
( <b>2</b> ) Ratio	of radius of	of curvature to b	ankfull width (	R <sub>c</sub> / W <sub>bkf</sub> )			Level II	General	prediction	
(3) Ratio	of pool slo	pe to average	water surface s	ope (S <sub>p</sub> /S)			Level II	General <sub>I</sub>	prediction	
(4) Ratio	of pool slo	pe to riffle slop	e(S <sub>p</sub> / S <sub>rif)</sub>				Level II	General	prediction	
(5) Ratio	of near-ba	nk maximum d	epth to bankfull	mean depth (	d <sub>nb</sub> / d <sub>bkf</sub> )		Level III	Detailed	prediction	
(6) Ratio	of near-ba	nk shear stress	to bankfull she	ear stress ( $ au_{\sf nb}$ /	τ <sub>bkf</sub> )		Level III	Detailed	prediction	
( <b>7</b> ) Veloc	ity profiles	/ Isovels / Velo					Level IV		lation	
el I	(4)							_		
Level	(1)									
_		Radius of	Bankfull	Thousand Thing	Near-Bank	ging now			20 2/11/01/10	
	(2)	Curvature	Width W <sub>bkf</sub>	Ratio R <sub>c</sub> /	Stress					
	(2)	R <sub>c</sub> (ft)	(ft)	W <sub>bkf</sub>	(NBS)	1				
=		D 101			Near-Bank		Dom	inant	ı	
Level II	(3)	Pool Slope S <sub>p</sub>	Average Slope S	Ratio S <sub>p</sub> / S	Stress (NBS)		Near-Bar			
Le		op	S.SpS S	γιαπο οργ ο	(1.120)			erate		
					Near-Bank					
	(4)	Pool Slope	Riffle Slope	Ratio S <sub>p</sub> /	Stress					
		S <sub>p</sub>	S <sub>rif</sub>	S <sub>rif</sub>	(NBS)	1				
		Near-Bank		Datio d /	Near-Bank					
	(5)	Max Depth d <sub>nb</sub> (ft)	Mean Depth d <sub>bkf</sub> (ft)	<i>Ratio</i> d <sub>nb</sub> / d <sub>bkf</sub>	Stress (NBS)					
=		9-110 (14)	SDKI (15)	S DKI	(NBO)					
Level III				Near-Bank			Bankfull			
Le		Near-Bank		Shear			Shear		Near-Bank	
	(6)	Max Depth	Near-Bank		Mean Depth		Stress τ <sub>bkf</sub> (	Ratio $\tau_{\text{nb}}$ /	Stress	
		d <sub>nb</sub> (ft)	Slope S <sub>nb</sub>	lb/ft <sup>2</sup> )	d <sub>bkf</sub> (ft)	Slope S	lb/ft <sup>2</sup> )	$ au_{bkf}$	(NBS)	
2		Velocity Grad	dient (ft / sec	Near-Bank Stress						
Level IV	(7)	/ f		(NBS)						
Ľ										
		Cor	verting V	alues to a t	lear-Bank	Strees (NE	SS) Rating			
Near-E	Bank Str	ess (NBS)	Iverting va	aides to a i		ethod numb				
	rating		(1)	(2)	(3)	(4)	(5)	(6)	(7)	
Very Low			N / A	> 3.00	< 0.20	< 0.40	< 1.00	< 0.80	< 0.50	
Low			N / A	2.21 – 3.00	0.20 - 0.40	0.41 - 0.60	1.00 – 1.50	0.80 - 1.05	0.50 - 1.00	
Moderate			N / A	2.01 – 2.20	0.41 - 0.60	0.61 - 0.80	1.51 – 1.80	1.06 – 1.14	1.01 – 1.60	
	High		See	1.81 – 2.00	0.61 – 0.80	0.81 – 1.00	1.81 – 2.50	1.15 – 1.19	1.61 – 2.00	
	Very Hi	-	(1)	1.50 – 1.80	0.81 – 1.00	1.01 – 1.20	2.51 – 3.00	1.20 – 1.60	2.01 – 2.40	
	Extren	ne	Above	< 1.50	> 1.00	> 1.20	> 3.00	> 1.60	> 2.40	
				Overall N	ear-Bank S	Stress (NB	S) rating	Mode	erate	
								_		

**Worksheet 3-13.** Summary form of annual streambank erosion estimates for various study reaches.

Stream:	tream: Holmes Run Location: Project Reach											
Graph Used:	District of Columbia	Total Strop	m Length (ft):		i rojeci nea		7/16/18					
		Total Sirea										
Observers:	Biggs/Hepp (2)	(3)	Valley Type:	(5)	(6)	Stream Type:	(8)					
Station (ft)	BEHI rating (Worksheet 3- 11) (adjective)	NBS rating (Worksheet 3- 12) (adjective)	Bank erosion rate (Figure 3-9 or 3-10) (ft/yr)	Length of bank (ft)	Study bank height (ft)		Erosion Rate (tons/yr/ft)					
1. BEHI #1 2. BEHI #2	Very High High	High High	1.00	85.0 148.0	7.0	595.00 740.00	0.420					
3. BEHI #3	Extreme	High	2.40	220.0	8.0	4224.00	1.152					
4. BEHI #4	Extreme	Very High	3.20	263.0	6.5	5470.40	1.248					
5. <b>BEHI #5</b> *	High	High	1.00	78.0	6.0	468.00	0.360					
6. <b>BEHI #6*</b>	Moderate	Low	0.12	101.0	3.0	36.36	0.022					
7. <b>BEHI #7*</b>	Low	Low	0.02	42.0	3.5	2.50	0.004					
8. <b>BEHI #8</b>	Very High	Moderate	0.50	290.0	10.0	1450.00	0.300					
9. <b>BEHI #9*</b>	Moderate	Low	0.12	80.0	9.0	86.40	0.065					
Sum erosion s	ubtotals in Column (7	') for each BEHI/N	IBS combinat	ion	Total Erosion (ft³/yr)	13072.66						
Convert erosio	n in ft <sup>3</sup> /yr to yds <sup>3</sup> /yr {	27}	Total Erosion (yds³/yr)	484.17								
Dry Bulk Densi	ity of the Soil is 120 l		Total Erosion (tons/yr)	784.36								
	ion per unit length of stream (ft) surveyed}	tons/yr) by	Total Erosion (tons/yr/ft)	0.600								

BEHI and NBS ratings were determined using ocular estimates and field calibration technique as described in Section 3.2